

REMARKS

This amendment responds to an Office Action dated August 7, 2002, in the above-identified patent application. Claims 1-17 were filed in the original application, and are currently pending.

By this response, Applicant has amended the specification and the figures. Claims 1-17 are under consideration in the application, of which claims 1 and 11 are in independent form. No claims are currently allowed. This Response is being filed within three months of the Office Action outstanding. No additional claim fees or time extension fees are required.

In the Office Action dated August 7, 2002, the Examiner objects to the Abstract in stating that the terms "comprise" and "comprises" are legal phraseology and should not be used. Applicant has amended the Abstract to delete these terms. Accordingly, Applicant requests the Examiner to withdraw the objection to the Abstract.

In the Office Action dated August 7, 2002, the Examiner rejects claims 1-17 under 35 U.S.C. 112, second paragraph, in stating: "In claim 1, it is unclear what "electrical source" represents. In claim 2, it is unclear what "power source" represents. In claim 11, it is unclear

what "a ground connection" and "an outside power source" represent. In claim 16, it is unclear what "heating coils", "anodized aluminum plate" and "a thermostat" represent. In particular, the Examiner states that these elements are not shown in the drawings.

Applicant has amended the specification and the figures to give reference numerals to these elements, which were described in the specification as originally filed. In particular, the outside electrical/power source has now been labeled as 28a, the ground has been labeled as 30a, and the heating coils have been labeled as 80a. The reference numbers and drawing changes that have been added for reference of these elements is not new matter because the elements were clearly described in the application as originally filed. Applicant notes that the anodized "aluminum plate" and the "thermostat" were labeled as reference numbers 102 and 100, respectively, on page 20, lines 21 and 22, and shown in Figure 4 of the application, as originally filed. Applicant believes that the Examiner's rejection of the claims under 35 U.S.C. 112, second paragraph, have been overcome and, therefore, respectfully requests the Examiner to withdraw this rejection of the claims.

There are no other objections to claims 2, 3, 6, 10, 12 and 15-17. Accordingly, Applicant believes these

dependent claims include allowable subject matter and Applicant requests the Examiner to indicate the same.

In the Office Action dated August 7, 2002, the Examiner rejects claims 1, 4-5, 7, 8, 9, 11, 13 and 14 under 35 U.S.C. 103(a) as allegedly being unpatentable over Spaziani (U.S. Pat. No. 5,631,571). Applicant respectfully disagrees. Applicant will address independent claims 1 and 11 in turn.

Regarding Applicant's claim 1, Spaziani teaches an optical device, such as CCDs, photodiodes, and phototransistors, (Spaziani, column 3, lines 55-56), wherein an electrical input is supplied and an electrical output is measured, after an optical input is supplied which mimics an actual optical input during normal working conditions. In other words, the optical device of Spaziani has its electrical components tested by the input of an optical input that is similar to an optical input the device may encounter during working conditions. (Column 3, lines 13-15 and lines 29-33: Spaziani lists as its object of the invention: "supplying electrical input port signals and electrical output loading to said circuit die through said array of electrical probe elements as needed for functional operation;" and then "evaluating electrical signals communicated from said circuit die to said testing apparatus via said array of electrical probe elements, in response to

received optical and electrical signals, against expected die performance criteria."). The optical input of Spaziani is used to determine whether the the device is correctly categorizing and/or recognizing the optical input itself.

In contrast, the optical input to Applicant's device is used as a switch to activate electrical power to the device and is not itself a measured variable, i.e., Applicant is not measuring the optical input itself but instead is using the optical input to turn on and off electrical power to the device to determine if the electrical properties of the device are functioning properly. In particular, Applicant's claim 1 recites: "optically stimulating said optically sensitive device so as to allow current to flow through said optically sensitive device from said electrical source to said component so as to exercise said component." Spaziani does not teach or suggest an optical device wherein electrical current flows through the optical device when the optical device is stimulated, i.e., Spaziani does not teach or suggest an optical switch that is optically stimulated to allow power to electrical components under test/exercise. Accordingly, Applicant requests the allowance of independent claim 1, and corresponding dependent claims 4-5, 7, 8 and 9.

Regarding Applicant's claim 11, Spaziani teaches a probe card 106 (Fig. 1) that supports an underside of wafer

100 (Fig. 1). A single optical fiber 114 (Fig. 2) is positioned above an optical port 203 (Fig. 2) of circuit device 218 (Fig. 2) (column 6, lines 8-25). Spaziani teaches only a single optical fiber 114 that is moved over wafer 100 to sequentially illuminate different optical devices on the wafer. (column 6, lines 54-63). Due to Spaziani's use of only a single optical fiber, there is no need for, and Spaziani therefore teaches away from, a probe card that blocks portions of the wafer from optical stimulation in regions where testing is not being conducted or in regions where optical illumination is not desired.

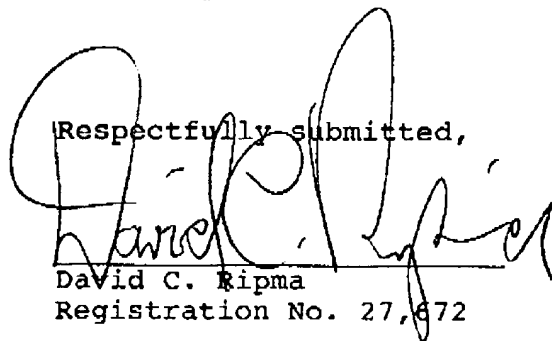
In the Office Action the Examiner states:

"Furthermore, it appears that Spaziani et al also suggest that a fiber bundle as shown in figure 2b is also used in transmitting light beams to the optically sensitive device (203)." Applicant respectfully disagrees. Spaziani's Fig. 2b shows different types of the single fiber that may be used in their invention, each single fiber having a different diameter. (Column 7, lines 3-8: "Such an individual fiber is represented at 240 in FIG. 2b of the drawings. The fibers at 242 and 244 in the FIG. 2b drawing represent a standard fiber of either the graded or step index type and an oversize core optical fiber respectively") (emphasis added).

In contrast, Applicant's claim 11 recites "a probe card including: ... an aperture that extends through said probe card and that is aligned with an optically sensitive device on said integrated circuit during exercising of the integrated circuit; and a light source that provides a beam of light through said aperture." Spaziani does not teach or suggest a probe card having an aperture, wherein the light source provides light through the aperture, as recited in Applicant's claim 11. Spaziani teaches away from use of a probe card with an aperture because Spaziani teaches only a single, movable optical fiber. Accordingly, Applicant requests the allowance of independent claim 11, and corresponding dependent claims 13 and 14.

Applicant respectfully requests entry of this Amendment and reconsideration of the application as amended.

Respectfully submitted,



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Date: November 7, 2002

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Appendix A

The present pages 14-17 of the present Response indicate the changes to the specification and the claims made herein in application Serial Number 09/526,955, filed March 16, 2000

Deleted material is indicated in brackets [] and added material is shown underlined.

In the Abstract, on page 37, the following paragraph has been deleted:

[An apparatus comprises multiple light sources that are applied to specific locations on the surface of a wafer for the purpose of causing a component on a die to respond as if a digital signal had been applied to the component. The multiple light sources may comprise several thousand point light sources such as the individual fibers of a fiber optic bundle. The light is controlled in such a manner to stimulate operation of the electronic circuit for the purpose of burning in the circuit.]

and the following replacement paragraph has been substituted therefore:

An apparatus includes multiple light sources that are applied to specific locations on the surface of a wafer for the purpose of causing a component on a die to respond as if a digital signal had been applied to the component. The multiple light sources may include several thousand point light sources such as the individual fibers of a fiber optic bundle. The light is controlled in such a manner to stimulate operation of the electronic circuit for the purpose of burning in the circuit.

In the specification, on page 11, line 15, through page 12, line 3, the following paragraph has been deleted:

[Diode 20a is connected to a power source through contact point 28. Diode 20b is connected to a ground through contact point 30. Contact pad 18 and diodes 20a and 20b are each connected to component 24 which in turn typically is connected to other components 24 of die 16. The orientation of diodes 20a and 20b ensures, under typical operating conditions, that the voltage at component 24 is within the range of ground (zero volts) and the voltage of the power source, also called Vcc. If the voltage at contact pad 18, or component 24, is greater than the voltage of power source 28, diode 20a biases the current, i.e., allows the current to flow through diode 20a toward source 28,

to lower the voltage at the contact pad to that of the voltage of power source 28. If the voltage at contact pad 18, or at component 24, is less than ground, i.e., a negative voltage, diode 20b biases the current, i.e., allows the current to flow through diode 20b toward contact pad 18, to increase the voltage at the contact pad to that of a zero voltage."

and the following replacement paragraph has been substituted therefore:

Diode 20a is connected to an electrical or power source 28a, i.e., a source of current, through contact point 28. Diode 20b is connected to a ground 30a through contact point 30. Contact pad 18 and diodes 20a and 20b are each connected to component 24 which in turn typically is connected to other components 24 of die 16. The orientation of diodes 20a and 20b ensures, under typical operating conditions, that the voltage at component 24 is within the range of ground (zero volts) and the voltage of the outside power source 28a, also called Vcc. If the voltage at contact pad 18, or component 24, is greater than the voltage of power source 28, diode 20a biases the current, i.e., allows the current to flow through diode 20a toward source 28, to lower the voltage at the contact pad to that of the voltage of power source 28. If the voltage at contact pad 18, or at

component 24, is less than ground, i.e., a negative voltage, diode 20b biases the current, i.e., allows the current to flow through diode 20b toward contact pad 18, to increase the voltage at the contact pad to that of a zero voltage.

In the specification, on page 21, line 20, through page 22, line 2, the following paragraph has been deleted:

[Heating device 80 may comprise a resistive heating coil, a ceramic heater, a moving gas or liquid heat exchanger system, or any other heating device sufficient for purposes of the present invention. Heating device 80 typically is in direct contact with aluminum plate 102 so as to allow direct heat conduction to the wafer through plate 102 from device 80.]

and the following replacement paragraph has been substituted therefore:

Heating device 80 may comprise a resistive heating coil 80a (a section thereof being shown), a ceramic heater, a moving gas or liquid heat exchanger system, or any other heating device sufficient for purposes of the present invention. Heating device 80 typically is in direct contact with aluminum plate 102 so as to allow direct heat conduction to the wafer through plate 102 from device 80.

Appendix B
Replacement Drawing Sheets

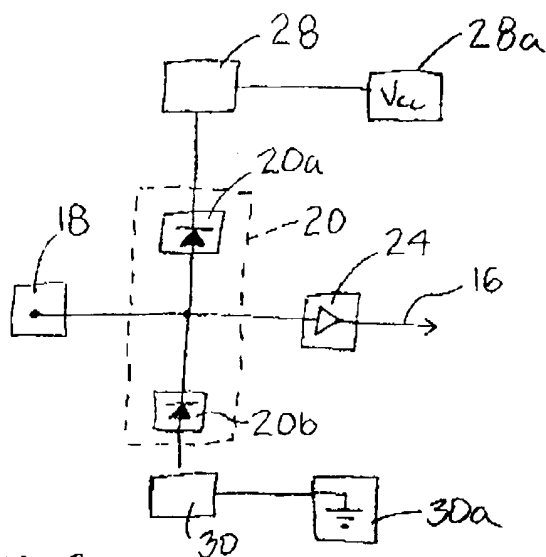


FIG. 3

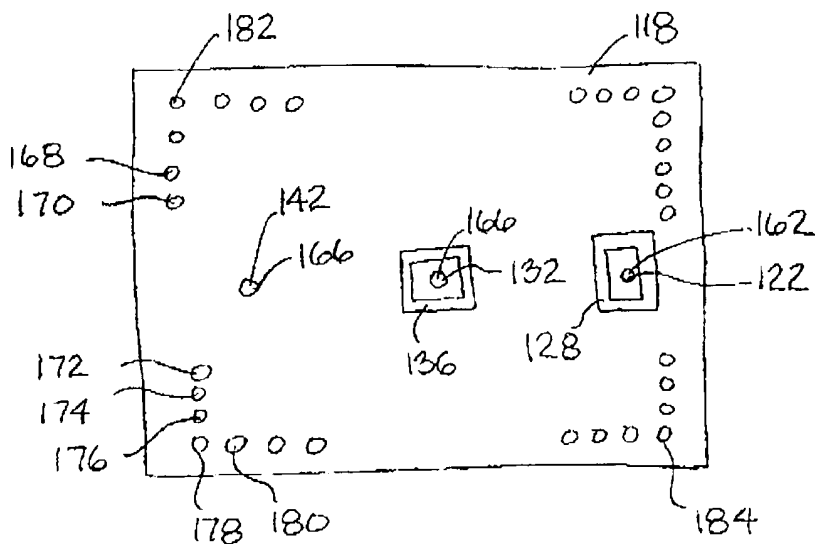


FIG 13

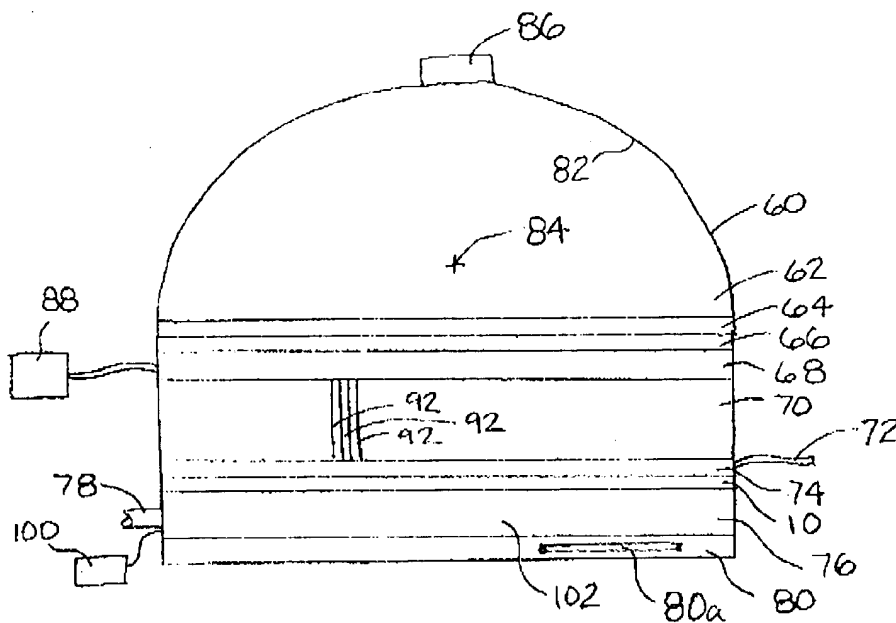


FIG. 4

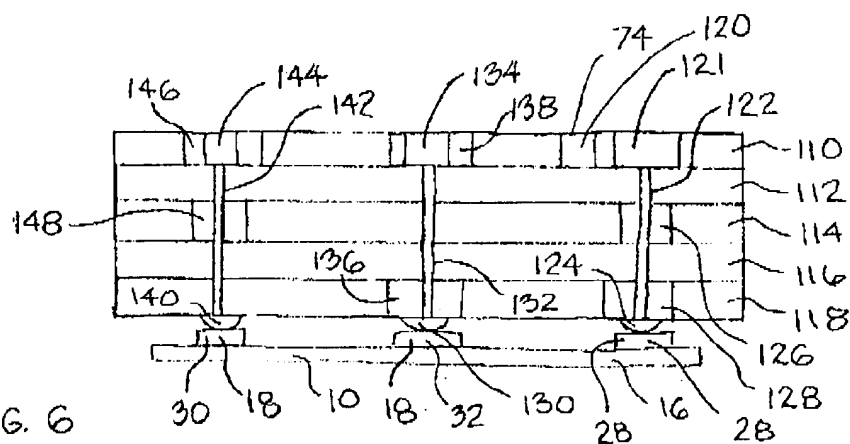


FIG. 6